

## **DETAILED ACTION**

### ***Introduction***

1. Applicants' amendments and remarks filed 11/13/2009 have been entered. Claims 2, 3 and 6 are active.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. In response, the grounds of rejection have been updated as set forth below. The grounds of rejection not maintained are withdrawn.

### ***Rejections Based on Prior Art***

4. Claims 6 and 7 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Peters et al. [US 3321765].

Peters' invention relates to a stepped-index Luneberg lens. The lens part is formed by molding pre-expanded thermoplastic foam particles [col. 3, ll. 57]. Each shell of the lens has uniform dielectric constant throughout [col. 3, ll. 65-67]. To obtain required dielectric constant, the thermoplastic is loaded (filled) with a material such as titanium dioxide (inorganic filler) [col. 4, ll. 40-43]. Examples of useful thermoplastic include polyethylene (polyolefin) [col. 4, ll. 36]. Granules of the thermoplastic are sieved into narrow size ranges [col. 4, ll. 66]. In order to obtain improved uniformity, the particles may be sieved after expansion [col. 5, ll. 23-24]. If there is a discrepancy between the weighed quantity of granules and the quantity required to fill

Art Unit: 1783

the mould chamber, some of the smaller or larger particles may be removed by sieving and the weight made up with larger or smaller particles [col. 5, ll. 52-56].

For claims 6 and 7, Peters is silent about the volume ratio of the polyolefin resin/filler, and the foamed layer has a dielectric constant of 1.5 or more. However, since Peters teaches that a Luneberg lens made of pre-expanded beads of thermoplastic resin with required amount of inorganic filler of a high dielectric constant, and each shell of the lens has uniform dielectric constant throughout, the amount of filler in the thermoplastic resin is result effective in lens performance. Workable ratio of resin/filler ratio and uniform dielectric constant of the foamed layers are deemed to be either anticipated by Peters, or obvious routine optimizations to one of ordinary skill in the art, motivated by the desire to obtain required properties for the same end uses (Luneberg lens) as the claimed invention. Regarding the product-by-process limitations, including: 1) uniformly cutting an extrudate into pellets less than  $\frac{1}{4}$  wavelength, adding foaming agent to the pellets, preliminary expansion, and molding expanded beads to have inorganic filler within  $\pm 0.5\%$  designed concentration, and 2) the pre-expanded beads are classified by gravity separation to a range of specified expansion characteristics, since these process limitations have not been shown on the record to produce a patentably distinct article, the formed articles are rendered *prima facie* obvious, and these limitations at the present time have not been given patentable weight. Regarding new added performance characteristics, since Peters clearly teaches uniformity of the foamed composition effects the performance, absent any evidence that such performance characteristics are unattainable by optimizing the uniformity, the examiner maintains that since Peters anticipates the general structure and composition of the claimed invention, and for the same end use (Lundberg lens), workable performance characteristics are

deemed to be either anticipated, or obvious routine optimizations, motivated by the desire to obtain an improved performance.

5. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peters et al. [US 3321765].

The teachings of prior art are again relied upon as set forth above.

For claims 2 and 3, the Official notice in the prior Office action “various titanate species, including barium titanate, strontium titanate, etc., are common and well known inorganic fillers having equivalent functionality of high dielectric constants to titanium dioxide” has been taken as admitted prior art. The selection of a known equivalent material based on its suitability for its intended use supported a *prima facie* obviousness determination. See MPEP § 2144.07.

### ***Response to Arguments***

6. Applicants argue at Remarks pages 5-6:

“Turning to the prior art, it is clear that Peters fails to disclose the sidelobe property of the Luneburg lens as recited by claim 6. It is also clear that Peters neither teaches nor suggests the present claimed subject matter with which an electrically uniform dielectric can be formed when the concentration of the inorganic filler having a high dielectric constant is within a range of  $\pm 0.5\%$  with reference to the designed concentration and the size of each pellet formed by mixing of the resin and the filler is  $1/4$  or less of the wavelength of the electromagnetic wave used. In addition, Peters shows that it is essential to form particles of various sizes. Accordingly, since the manufacturing process of Peters is different from the present disclosure, the properties or characteristics of the Peter's Luneburg lens is different from the Luneburg lens of claim 6.”

However, regarding the performance characteristics, since Peters clearly teaches uniformity of the foamed composition effects the performance, absent any evidence that such performance characteristics are unattainable by optimizing the uniformity, the examiner maintains that since Peters anticipates the general structure and composition of the claimed invention, and for the

same end use (Lundberg lens), workable performance characteristics are deemed to be either anticipated, or obvious routine optimizations, motivated by the desire to obtain an improved performance.

### ***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to VICTOR S. CHANG whose telephone number is (571)272-1474. The examiner can normally be reached on 6:00 am - 4:00 pm, Tuesday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Victor S Chang/  
Primary Examiner, Art Unit 1783